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ABSTRACT

In order to provide a foundation upon which teachers and curriculum planners could build courses of study and training plans in the field of tool and die making, a study has been commenced to develop a catalog of the tasks and criterion-referenced performance objectives required of tool and die makers. At the time of this report, research has been performed to determine the state of the art. Computer and manual information searches were conducted of the following data bases: Educational Resources Information Center (ERIC), the Current Index to Journals in Education (CIJE), Resources in Vocational Education (RIVE), and Abstracts of Instructional Materials/Abstracts of Research Materials in Vocational Education (AIM/ARM). Besides a literature search, information was also obtained by mail and telephone surveys of state departments of education, industry which employs tool and die makers, state directors of vocational education, the Air Force, and directors of Pennsylvania community colleges and area vocational-technical schools with tool and die programs. The results of this research were the compilation of a list of approximately 240 task-performance statements and the development of a list of tools and equipment required by tool and die makers. (The appendixes include the descriptors used in the data base searches, the lists of tools and equipment, the duty/task statements, the names of survey participants, and copies of survey letters and responses.) (ELG)

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STATE-OF-THE-ART
TOOL AND DIE MAKER PROJECT

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Pennsylvania Department of Education
Research Coordinating Unit
(Project No. 93-8013)

VOCATIONAL — TECHNICAL EDUCATION **Research Report**

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PROJECT PRELIMINARY REPORT

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STATE-OF-THE-ART STUDY

TOOL AND DIE MAKER

Prepared for the

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Bureau of Vocational Education

Pennsylvania State Department of Education

by

Division of Vocational - Occupational Studies

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INTRODUCTION

Vocational education has been founded on the premise that there was a need to supply youngsters and adults with job skills essential for employment in the world of work. This basic principle has not weakened with evolution of technological change. In fact, the reverse is true. Technological expansion has placed increased significance on vocational education to produce a more job ready worker versed in the entry level skills as they are known in modern industry today. Yet the task of establishing a curriculum in vocational education reflective of current industrial practices has grown more acute. "The Pennsylvania Bureau of Vocational Education has been vitally concerned about the need for improvement in vocational education program planning." As a result of this growing concern, the Bureau of Vocational Education has made available a grant to assist in the development of a catalog of performance objectives and criterion - referenced test items in occupational education.

Purpose

In order to supply a foundation upon which teachers and curriculum-makers could build courses of studies and training plans in the field of tool and die making, are necessary to develope a catalogue of tasks and criterion referenced performance objectives. Tool and Die Making was chosen because previous efforts in this area were never assembled in a finished form. Although Tool and Die Making as a subject is not

commonly taught, there remains a vital need to supply appropriate curriculum materials in this area for those who are involved are no less needful of the best educational materials available. In an attempt to meet this need this study was undertaken.

The purpose of this project is to develop a catalog of performance objectives and criterion-referenced test items in occupational education for the Tool-and-Die Maker and related occupations. This report includes a study of the State-of-the-Art, the development and list of tasks performed by the Tool-and-Die Maker, and finally, the writing of a modified reason of a domain report. The information presented is based on a preliminary of materials presented as part of the State-of-the-Art study.

Definition of Terms

The following terms are supplied to establish operational definitions as they apply to this study.

Catalogs. A comprehensive collection of performance objectives, performance guides, criterion - referenced measures, and related data organized by a job structure or career ladder within a domain of interest.

Criterion-Referenced Measure. An exercise based upon a performance objective and designed to measure attainment of that objective.

Die Maker. The diemaker is a skilled machinist who specializes in making dies which are used for die casting, stamping, and pressing out metal parts. He also reconditions and repairs damaged or worn out dies, and may be called upon to make tools and guages. His trade requires a very high degree of manual skills as well as a good knowledge of shop math, blueprint reading, and the qualities of many kinds of metal.

Precision Tools. Are those which possess the quality of exactness or a high degree of accuracy.

Domain Report. A document consisting of the following five items:

(1) An updated and finalized version of the State-of-the-Art report;

(2) An annotated bibliography of germane references found during the State-of-the-Art study;

(3) The final version of the occupational inventory booklet including background information and letter used to communicate with the incumbent workers or other contact persons;

(4) A listing of persons interviewed during the development of the occupational inventory booklet (incumbent workers, supervisors, technical content experts, etc.). This list should contain the name of the person, job title, address of business or industry, and date of the interview; and

(5) A brief description of the design to be used for sampling incumbent workers with emphasis upon population indentification and methods used to derive the sample.

D.O.T. Code. A given number used to identify a specific job within a given domain of related job titles.

Duty. A major segment of work comprising related tasks.

Machinist. The machinist is an occupation concerned with shaping metal parts by milling, turning, planing, abrading, boring, chipping, sawing, and shaving with a variety of metal-working machines. Includes laying out, job setting, fitting, assembling, and repairing in an industrial setting.

Occupational Area. A group of jobs that are related on the basis of required skills and knowledge.

Occupational Descriptors. Terms used in a computer search of the field to focus on the desired information pertaining to a given occupation.

Pattern Maker. The pattern maker is a skilled craftsman whose job is to construct the patterns and core boxes which are used to make molds in casting parts from metal or plastic. He possesses an unusually high degree of manual skill because of the precision required in the many hard operations involved in pattern building.

Performance Guide. A series of steps, arranged in a sequence ordinarily followed, which, when completed, may result in the performance of a task.

Performance Objectives. A statement in precise, measurable terms of a particular behavior to be exhibited by a learner under specific conditions.

Precision Tools. Are those which possess the quality of exactness or a high degree of accuracy.

Related Occupations. Occupations that possess similar knowledge and skills whereby these skills and knowledge overlap at different degrees of requirement for each occupation.

State-of-the-Art (SOA) Study. Research conducted to determine the current status of performance-based instructional materials and practices in the domain area under study and to obtain other information that might be useful in catalog development.

Task. A unit of work activity which constitutes logical and necessary steps in the performance of a duty. A task has a definite beginning and ending point in its accomplishments and generally consists of two or more definite steps.

Task Analysis. The process of reviewing elements of a job for the purpose of improving training program content across program levels of vocational-technical education.

Tool and Die Maker. A skillled craftsman who specializes in all types of tools, zigs, fixtures, and dies in use on sheet metal work; plans, lays out, and makes necessary templates from blueprints or drawings to determine the sequence of work operations using a variety of hand tools and precision instruments.

Toolmaker. An occupation that is concerned with the entire scope of constructing, repairing, maintaining, and calibrating machine-shop tools and precision instruments.

Objectives

To accomplish the goal of the above investigation, the following objectives were developed:

1. Conduct a State-of-the-Art study for the job title -- Tool and Die Maker.
2. Develop an inventory of tasks based on the State-of-the-Art study and organize this in booklet form.
3. Develop a final report of the domain study based on the State-of-the-Art study.
4. Sample incumbent workers in the tool and die maker field as to their responses to the tasks identified in the domain study.
5. Prepare a catalog of tasks required of the tool and die maker and related occupations.
6. Develop a listing of D.O.T. classifications of related occupations in which graduates in tool and die making are working in the Commonwealth of Pennsylvania.

Methodology

To obtain available information necessary to the preliminary preparation of the domain report on Tool-and-Die Making, and also to meet the objectives of the State-of-the-Art study, the following research procedures were performed.

1. ERIC search. A computer search of the Educational Resources Information Center (ERIC) data base was conducted by Vocational Education Information Network (VEIN), Millersville State College, Millersville, Pennsylvania. A list of general descriptors developed by the Educational Vocational Resources Information Center (ERIC) (see Appendix) was used by VEIN to conduct the search. In addition, a manual search using ERIC descriptors and the objectives outlined in the State-of-the Art study was performed by the project staff.

2. CIJE search. Using the descriptor terms developed by ERIC, a computer search of the Current Index to Journals in Education (CIJE) was performed through the Vocational Education Information Network (VEIN).

3. RVE search. A computer search of the Resources in Vocational Education data base was performed by Vocational Education Information Network (VEIN). The descriptors listed in the Appendix A and developed by ERIC were used in performing the search.

4. AIM/ARM search. A manual and computer search of abstracts of Instructional Materials in Vocational-Technical Education (AIM) and Abstracts of Research Materials in Vocational Education (ARM) were conducted by Vocational Education Information Network (VEIN) using the Educational Resources Information Center descriptors (see Appendix A & B) and the descriptors in the Technical Handbook Network of VTEC.

5. A review of the literature on tool and die making was accomplished.

6. Letters of Inquiry. A form letter was mailed to:

   (a) Selected state departments of education.

   (b) Selected industrial establishments employing tool and die makers and/or hundred workers.

   (c) State Directors of Vocational Education.

   (d) Department of the Air Force.

7. Survey by Telephone. Information was obtained from the following institutions by use of a questionnaire:

   (a) Director of Pennsylvania Community Colleges with Tool and Die Program (See appendix).

   (b) Director/Principal of Area Vocational-Technical Schools of Pennsylvania with Tool die program. (See appendix).

   (c) In plant visits to selected industrial establishments employing tool and die makers and related occupations.

Findings

Overview

The findings of the preliminary domain report are based on information obtained from:

(1) Telephone survey questionnaire of Area Vocational Technical Schools and Community Colleges of the State of Pennsylvania.

(2) Computer searches of Educational Resources Information Center (ERIC), Current Index of Journals in Education (CIJE), Resources in Vocational Education (RVE), Abstracts of Instructional Materials in Vocational-Technical Education (AIM), and Abstracts of Research Materials (ARM) in Vocational Education were performed by the Vocational Education Information Network (VEIN).

Letter of inquiry to State Directors of Vocational Education, United State Military and other agencies resulted in a number of references, each of which is discussed in greater detail in the appropriate objective finding.

The final report of this study will be comprised of a validated listing of duty and task performance statements, a field testing of a catalog of performance objectives and criterion-referenced measures.

Objective 1: Conduct a state-of-the-art study for the job title--Tool and Die Maker

Area Vocational Technical Schools which offered Tool and Die Making were identified through VEMIS. These schools were surveyed by telephone to gather information about courses and/or programs related to Tool and Die Making. Of the schools contacted only 9 (47%) were reported as either teaching courses or presented a program in Tool and Die Making (Appendix F). The Area Vocational Schools that offered programs in Machine Shop mentioned that Tool and Die was a related machine shop occupation which required more precision and technical competency. Using similar survey approach, eighteen Community Colleges of the State of Pennsylvania were contacted by telephone. Only 2 (11%) of the colleges contacted were found to offer courses and/or programs in Tool and Die Making (Appendix G).

Using the ERIC descriptors, a computer search of the literature by the Vocational Education Information Network (VEIN) revealed only a limited amount of citations relating to the topic - Tool and Die. In addition, a manual search of the literature using the Educational Resources Information Center (ERIC) and Vocational Technical Education handbook descriptors was performed. Inquiries to the United States Military, State Directors of Vocational Education and other agencies provided some relevant information for tool-and-die making and other related occupations. Table 1 illustrates the nature of the materials that were obtained from different sources. The column classified as resource materials consists of course outlines, task performance statements, equipment and tool listings and other categories. A field trip was made to a glass making industry to observe Tool and Die Makers and other related occupation incumbent workers in practice.

Objective 2: Develop an Inventory of Tasks Based on the State-of-the-Art Study and Organize This in Booklet Form

The computer and manual searches of the literature furnished a comprehensive list of performance tasks that were applicable to the Tool and Die Maker (Appendix E). Several sources, however, were found to list task statements that were more applicable to the machinist. Perhaps the most detailed list of duty and task performance statements received as a result of our inquiries was obtained from the United States Military. It is necessary to point out, however, that these listings were more appropriate for the machinist and not necessarily that of the Tool and Die Maker.

Responses obtained from State Directors of Vocational Education and other agencies pertaining to task performance statements were very useful. Although only a few states provided resource materials, many of those who responded and were unable to contribute, indicated names of persons who could be contacted for information (Appendix H and Table 1).

Resource materials received from the Area Vocational Technical Schools were more competency-based and were developed primarily for students at the Secondary School level. While most of the course outlines received from the Area Vocational Technical Schools and Community Colleges were basically theoretical only a few could be translated to performance tasks with little difficulty (Table 1).

Objective 3: Develop a Final Report of the Domain Study Based on the State-of-the-Art Study

The final report of this study will be comprised of a validated listing of duty and task performance statements, a field testing of a catalog of performance objectives and criterion-referenced measures. A complete listing of tools and equipment developed as a part of this report (Appendix C & D)

will also be tested by the incumbent workers. In addition, the final report will include a list of persons interviewed, a description of the sampling design for incumbent workers including population identification, and a report on the State-of-the-Art as to learning and to utilization to date.

Objective 4: Sample Incumbent Workers in the Tool and Die Maker Field as to Their Responses to the Tasks Identified in the Domain Study

In the final domain report, the incumbent workers' input will be collected by means of a random sample. Sample size will be determined once the total population on all successful tool and die makers has been identified. A follow-up of non-respondences will be conducted by letter and telephone. This data will then be analyzed by computers on the University Park Campus.

Objective 5: Prepare a Catalog of Tasks Required of the Tool and Die Maker and Related Occupations

An inventory of tasks to form the basis for a completed catalog of performance objectives and criterion-referenced measures, and a report of findings will be made to the RCU. This phase of our findings will be written in greater detail when the final report is concluded.

Objective 6: Develop a Listing of Dictionary of Occupational Titles Classification of Related Occupations in Which Graduates in Tool and Die Working in the Commonwealth of Pennsylvania

A listing of occupations and coding in which employment is being entered by graduates of present tool and die maker programs will be included in the final report. These listings can be obtained in the Dictionary of Occupational

Titles, 1977. The Occupational descriptors for O. E. Code 17, 23, 07 00 00 and the D.O.T. codes 601.280-046 Tool and Die Maker; 601.280-038 Template Maker; 601.280-022 Die Sinker; 601.281-026 Tookmaker, Bench; 601.380-010 Carbide Operator; and 601.381-010 Die Finisher are among the listing of Toolmakers and related occupations most commonly identified.

TABLE 1

List of Contributors to

Domain Study of Tool & Die Curriculum Development

Resource Materials	West Side AVTS	Erie County AVTS	Bethlehem AVTS	Greater Johnstown AVTS	Centre County AVTS	Central Montgomery County AVTS	Butler County Comm. College	Williamsport Area Comm. College	Dept. of Navy Tennessee	U.S. Army Personnel Center Virginia (7)	Dept. of Air Force Texas (9)	U.S. Dept. of Labor Harrisburg, PA	Wagener and Arthur (3)	Stern (1)	U.N. Industrial Dev. Org. (2)	Smith (27)	Wisconsin Board of Voc. and Adult Education (12)	Dept. of Education New Mexico	Dept. of Public Instruction North Carolina	IUE Apprenticeship Programs District I Field Coordinator, Pa.
Course of Study:																				
Outline	X	X	X				X													
Objectives		X	X																X	
Shop Management Practices		X																		
Skill Competency Development Jobs		X																		
Task Statements		X						X	X	X	X		X	X	X	X				X
Job Description of Toolmaker		X																		
Equipment and Tools		X					X	X			X	X	X	X	X	X				
Competency-based Statements				X	X	X													X	
Instructional Outline:																				
a. Graphic Language			X																	
b. Shop Mathematics			X																	
c. Manufacturing Processes			X																	
d. Materials - Public Instruction			X																	
e. Reference Materials		X	X															X		
f. Tool Design Methods			X																	
Machine Shop Safety																	X			
Shop Standard																	X			
Apprenticable Trades																				X
Training Standards																				X

Summary

The purpose of this preliminary report was to formulate a listing of duty and task performance statements required of the Tool and Die Maker.

Area Vocational Technical Schools and Community Colleges of Pennsylvania identified as offering courses and/or programs in Tool and Die were surveyed by telephone questionnaire. These findings are indicated in Table 1 and Appendix F and G.

Computer and manual searches of the literature revealed only a limited amount of citations relating to the topic - Tool and Die. However, approximately 240 task performance statements were identified as a result of the literature search and from materials obtained from outside sources. In addition, a listing of tools and equipment required of the incumbent workers were developed from several sources.

The United States Military and State Directors of Vocational Education contributed information pertaining to task statements and that were relevant to the machinists. Resource materials received from Area Vocational Technical Schools were more competency-based. Although most of the materials received were course outlines, only a few could be translated in terms of performance tasks.

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ACKNOWLEDGEMENTS

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APPENDIX A

ERIC DESCRIPTORS

The following descriptors were used in our search of the ERIC, CIJE and RVE computer search.

Occupational Descriptors

- Tool and Die Makers
- Metal Working Occupations

General Descriptors

- Performance Criteria
- Criterion Referenced Tests
- Performance Specifications
- Behavioral Objectives
- Occupational Surveys
- Job Analysis
- Systems Concepts
- Instructional Design
- Curriculum Guide

APPENDIX B

VTEC Descriptors

APPENDIX B

VTEC Descriptors

General Descriptors	Occupational Descriptors
Performance Criteria	O.E. Code: 17,23,07 00 00
Criterion-Referenced Tests	601 Toolmakers and Related Occupations
Performance Specifications	*601.280-046 Tool-and-Die Maker
Performance Contracts	601.280-038 Template maker, extrusion die.
Behavioral Objectives	601.280-022 Die Sinker
Training Objectives	601.281-026 Toolmaker, Bench
Occupational Surveys	601.380-010 Carbide Operator
Job Analysis	601.381-010 Die Finisher
Job Skills	
Technical Reports	
Curriculum Development	
Educational Research	
Systems Development	
Systems Concept	
Experimental Curriculum	
Instructional Design	
Manual	
Tool Listing	
Tool Equipment	
Course Outline	

APPENDIX C

List of Tools

LIST of TOOLS

Semi-Precision and Common Precision Tools

A. Precision Tools

1. Micrometers
2. Screw thread micrometer
3. Inside Micrometer
4. Depth micrometer
5. Tube micrometer
6. Vernier caliper
7. Vernier depth gage
8. Gear tooth vernier caliper
9. Universal vernier bevel protracter
10. Indicating gage
11. Universal junior indicator
12. Vernier height gage
13. Jigs
14. Taps
15. Dies
16. Reamers
17. Template

B. Semi-Precision Tools

1. Combination square
2. Center head
3. Divider
4. Trammed
5. Calipers - inside & outside
6. Hermaphrodite caliper
7. Telescoping gage
8. Thickness gage
9. Surface gage
10. Parallels
11. V-Block
12. Planer gage
13. Solid square

C. Shaper

1. Vertical
2. Universal
3. Horizontal or Plain
4. Crank shaper
5. Automatic power feed
6. Planer

LIST of TOOLS

D. Lathe

1. Screw machine
2. Horizontal turret lathe
3. Vertical turret lathe
4. Back-off lathe
5. Bench lathe
6. Tool room lathe
7. Tool turret lathe
8. Automatic lathe
9. Hydroshift lathe
10. Turret lathe (Power feed)
11. Lathe dog

E. Milling Machines

1. All angle
2. Contour
3. Plain
4. Universal
5. Spherical types
   a. thread mills
   b. spline mills
   c. gear mills
6. Knee and column mills
7. Spiral mill
8. Cutters
   a. plain milling cutters
   b. Side milling cutters
   c. Angular cutters
9. Vertical

F. Grinders

1. Bench/Pedestal
2. Centerless
3. Surface
4. Surface Rotary
5. External
6. Cutter
7. Internal
8. Tool
9. Off-hand
10. Plain cylindrical
11. Universal cylinder
12. Universal Internal
13. Horizontal planer typed surface
14. Drill grinder
15. Universal tool and cutter
16. Valve grinding machines

G. Bench Hand Tools

1. Hammers
2. Pliers
3. Wrenches
4. Screw Drivers
5. Chisels
6. Files
7. Hacksaws

H. Drill Press

1. Handfeed
2. Powerfeed

I. Gages (Amplifiers)

1. Bore
2. Center
3. Depth
4. Drill
5. Go, No Go
6. Plastic
7. Precision
8. Radius
9. Surface
10. Telescope
11. Thickness
12. Thread
13. Caliper
14. Gage Blocks
15. Snap gage
16. Screw
17. Fillet
18. Small Hole
19. Nest gage

J. Misc. Equipment

1. Arbor Presses
2. Disintegrators
3. Gear cutting machine
4. Honing and Lapping machines

J. Misc. Equipment (Continued)

5. Power presses
6. Thread grinding machines
7. Numerical controled machine
8. Tonnage
9. Tool radial
10. Tool sinker
11. Tool Hydrotel
12. Tool Keller
13. Tool Planer
14. Turning tool-bit
15. Facing too-bit
16. Recessing tool-bit

APPENDIX D

Equipment Listing Used by Tool-And-Die-Maker and Other Related Occupations

Equipment Listing Used by Tool-and-Die-Maker and Other Related Occupations

Equipment Listings

Boring mill

Chemical machinery equipment

Cylindrical grinder

Do-all hand saw

Drill press

Electrical discharge machinery equipment

Harding Chucker

Honning equipment

Horizontal mill

Horizontal shaper

Jig borer

Jig grinder

Lathe

Numerically controlled equipment

Pantograph

Planer

Rotary grinder

Surface grinder

Universal mill

Vertical mill

Vertical shaper

3-jaw chuck

Collets and draw-in-bar

Surface plate

Electric Furnace

Milling machines

Shapers

Equipment Listings (Continued)

Drill dressers

Grinder

Milling cutters

Abrasive wheels

Sensitive drill press

APPENDIX E

Duty/Task Statements Required of

Tool-and-Die-Maker and Other Related Occupations

Duty/Task Statements Required of Tool-and-Die-Maker and Other Related Occupations

A. Bench Operations

1. Make shop drawings and sketches
2. Work from drawings and sketches
3. Compute areas and volumes
4. Make material lists
5. Order stock
6. Convert fractions to decimals
7. Convert English measurements to metric measurement
8. Lay out geometric forms
9. Lay out work pieces
10. Hand tap threads
11. Broaching metal
12. File radii
13. File flats
14. Using drafting tools
15. Hand chip metal
16. Hand ream metal
17. Remove damaged screws/studs
18. Dress damaged threads
19. Cut material with hacksaw
20. Scrape metal
21. Hand drill metal
22. Hand cut die threads
23. Hand sand metal
24. Hand polish metal
25. Hone on honing machine
26. Lap metal
27. Work and hammer metal with hand chisels/punches

28. Work metal with power chisels, punch and hammer
29. Work metal with portable drills
30. Design jigs using surface plate
31. Fabricate jigs using surface plate
32. Repair/modify jigs using surface plate
33. Design jigs using straight edge
34. Fabricate jigs using straight edge
35. Repair/modify jigs using straight edge
36. Design special tools
37. Fabricate special tools
38. Repair/modify tools
39. Design dies
40. Fabricate dies
41. Modify/repair dies
42. Design fixtures
43. Fabricate fixtures
44. Modify/repair fixtures
45. Design molds
46. Fabricate molds
47. Modify/repair molds
48. Set up oxy acetelyn equipment
49. Harden metals
50. Case harden metals
51. Temper metals
52. Normalize metals
53. Anneal metals
54. Test metals for hardness using Rockwell Tester
55. Test metals for hardness using file
56. Identify metals using fracture test

57. Identify metals using spark test

58. Identify metals using torch test

59. Service portable grinders

60. Service portable drills

61. Service portable sanders

62. Service portable polishers

63. Lap metal

B. Operate Lathe

1. Install lathe holding device
2. Compute feeds and speeds
3. Set up feed and speeds
4. Compute single depth of thread
5. Compute double depth of threads
6. Compute taper
7. Mount work between centers
8. Set alignment on lathe
9. Turn taper on lathe
10. Align lathe centers
11. Cut threads on lathe
12. Turn eccentric on lathe
13. Using dial indicator set up, work in four jaw chuck
14. Turn metal on lathe
15. Face metal on lathe
16. Drill metal on lathe
17. Counter sink on lathe
18. Counter bore on lathe
19. Ream on lathe
20. Turn groove on a lathe
21. Cut champer on a lathe
22. Turn shoulder on a lathe
23. Put metal on lathe
24. File metal on lathe
25. Knurl on a lathe
26. Cut internal threads on a lathe
27. File metal on lathe

28. Restore threads on a lathe
29. Cut taper using tape attachment
30. Cut taper using compound
31. Cut taper with tailstock offset
32. Cut internal tapers
33. Cut metal eccentrics on lathe
34. Cut contoured surfaces on lathe
35. Cut internal keyways on lathe
36. Cut single stock on lathe
37. Cut rectangular stock on lathe
38. Drill holes on lathe
39. Slot metal on a lathe
40. Shoulder turn on a lathe
41. Deburr on a lathe
42. Spot face on a lathe (counter bore)
43. Set up versa mill attachment
44. Grind metal internally with versa mill attachment
45. Grind metal externally with versa mill attachment
46. Shape metal with versa mill attachment
47. Spline mill metal with versa mill attachment
48. Side mill metal with versa mill attachment
49. Angular mill metal with versa mill attachment
50. Face metal with versa mill attachment
51. Circular mill metal with versa mill attachment
52. Thread metal with versa mill attachment
53. Make gears with versa mill attachment
54. Angular grind metal with versa mill attachment
55. Taper grind metal with versa mill attachment

56. Reface value with versa mill attachment

57. Grind tools/cutters with lathe versa mill attachment

58. Make year rack with versa mill attachment

59. Drill with versa mill attachment

60. Slot metal with lathe versa mill attachment

61. Reproduce designs from template

62. Perform cleaning and maintaining operation on lathe

C. Operate Milling Machine

1. Set up milling machine holders
2. Set up mill machine cutters
3. Compute feeds and speeds for milling operations
4. Compute depth and cuts for milling operations
5. Compute spur gear specifications for milling operations
6. Compute worm/ worm gear specifications for milling operation
7. Mill keyways on milling machine
8. Mill using plain index
9. Mill using rapid index on Milling machine
10. Mill using gulii index
11. Differential index
12. Helical mill on milling machine
13. Spiral mill on milling machine
14. Machine bevel worm/worm wheel
15. Machine bevel helical gear
16. Flat mill on milling machine
17. Angular mill on milling machine
18. Slot/T-slot on milling machine
19. Form mill on milling machine
20. Surface mill on milling machine
21. Conventional mill on milling machine
22. Climb metal on milling machine
23. Face mill on milling machine
24. Shadle mill on milling machine
25. Gang mill on milling machine

26. End mill on milling machine
27. Saw mill on milling machine
28. Slit metal on milling machine
29. Part metal on milling machine
30. Cut gears on milling machine
31. Spline mill on milling machine
32. Drill metal on milling machine
33. Bore metal on milling machine
34. Groove metal on milling machine
35. Clean up / maintain

D. Shaper and Planner

1. Grinding shaper tools
2. Making horizontal cuts on shaper
3. Making verticle cuts on shaper
4. Step shaping on shaper
5. Form shaping on shaper
6. Angular shaping on shaper
7. Shaping to layout
8. Cutting slots on shaper
9. Cutting slots on shaper
10. Cutting grooves on shaper
11. Cutting keyways on shaper
12. Planing horizontal surfaces
13. Planing verticle surfaces
14. Planing angular surfaces

E. Operate Drilling Machines

1. Set up drill press for drilling/reaming
2. Compute drill/reamer feeds and pads
3. Drill with drill press
4. Tap with drill press
5. Spotface with drill press
6. Counterbore with drill press
7. Ream with drill press
8. Lap metals with drill press
9. Cleaning drill press
10. Replace drill press component

F. Operate Grinding Machine

1. Set up utility grinders
2. Set up universal tool grinder
3. Angular grind on cylindrical grinder
4. Straight cylindrical grind on cylindrical grinder
5. Set up tool and cutter grinders
6. Grind lathe turning tools
7. Grind shaper tools
8. Grind parting tools
9. Grind chisels
10. Cylindrically grind tools and test bars
11. Externally grind
12. Internally grind
13. High speed grind
14. Surface grind
15. Grind end mills
16. Grind side milling cutters
17. Grind slop mills
18. Grind flex cutters
19. Grind form tools for milling operation
20. Grind threading tools (360 degree/acme/buttress/single)
21. Grind shear blades
22. Grind punch
23. Grind Hobbs
24. Grind reamers
25. Grind mandrels
26. Clean up/service grinding machine

G. Operate Metal Saws (Bandsaw - Hacksaw)

1. Plain sawing on bandsaw
2. Contour saw on bandsaw
3. Angular cut on bandsaw
4. Disk cut on a bandsaw
5. Polish with bandsaw
6. Etch with bandsaw
7. File with a bandsaw
8. Saw with hacksaw
9. Replace bandsaw blade/components
10. Butt weld bandsaw
11. Clean up after operations

H. Misc.

1. Measure using scale
2. Measure using micrometer
3. True with dial indicator
4. Use depth gauge
5. Reproduce lettering on hictograph from template
6. Measure using venier heighth gauge
7. Replace damaged studs
8. Restore threads
9. Assemble completed components
10. Design dies
11. Repair dies
12. Reapir dies
13. Design special tools
14. Forge metal parts
15. Analyze and normalyze metal
16. Case and pack hardened steel
17. Harden tool steel
18. Temper tool steel
19. Test for hardness

APPENDIX F

Area Vocational-Technical School of Pennsylvania

Contacted that Offered Courses and/or Program in Tool and Die

Area Vocational-Technical Schools of Pennsylvania
Contacted that Offered Courses and/or Program in Tool and Die

Source of Inquiry	Letters	Tele-Phone	Response
Admiral Reary AVTS P.O. Box 96 Ebensburg, PA 15931			
Altoona AVTS 1500 Fourth Avenue Altoona, PA 16603			
A.W. Beattie AVTS 9600 Babcock Blvd. Allison Park, PA 15101			
Beaver County AVTS 1260 N. Brodhead Road Monoca, PA 15061			
Berks County AVTS 11th Floor, Courthouse Reading, PA 19601			
Berks East AVTS R.D. 1 Oley, PA 19547			
Berks-West AVTS R.D. 1 Leesport, PA 19533			
Bethlehem AVTS 3300 Chester Avenue Bethlehem, PA 18017		X	Received Resource material.
Bradford County AVTS R.D. 1 Tonanda, PA 18848			
Bucks County Wistar Road Fairless Hill, PA 19030			
Carbon County AVTS 13th Floor Jim Thorpe, PA 18229			
Central Chester County 1635 East Lincoln Highway Coatesville, PA 19320			

Area Vocational-Technical Schools of Pennsylvania
Contacted that Offered Courses and/or Program in Tool and Die

Source of Inquiry	Letters	Tele-Phone	Response
Central Montgomery County AVTS New Hope St & Plymouth Rd. Norristown, PA 19401		X	Information was made available.
Central Westmoreland C. AVTS Avona Rd. R.D. 1 New Stanten, PA 15672			
Centre County AVTS Pleasant Gap, PA 16823		X	Information was made available.
Clarion County AVTS P.O. Box 1976 Shippenville, PA 16254			
Clearfield County AVTS P.O. Box 102 Clearfield, PA 16830			
Columbia-Montour AVTS R.D. 5 Bloomsburg, PA 17815			
Crawford County AVTS 860 Thurston Road Meadville, PA 16335		X	
Cumberland-Perry AVTS R.D. 4 Mechanicsburg, PA 17055		X	
Dauphin County AVTS 6001 Locust Lane Harrisburg, PA 17109			
Delaware County AVTS Area Vo-Tech Education State Building Sixth & Olive Street Media, PA 19063			
Delaware County (Aston) AVTS Birney Hwy. & Crozerville Rd. Aston Township Chester, PA 19014			

Area Vocational-Technical Schools of Pennsylvania
Contacted that Offered Courses and/or Programs in Tool and Die

Source of Inquiry	Letters	Tele-Phone	Response
Delaware County (Folcroft) AVTS Delmar Drive Folcroft, PA 19032			
Delaware County (Marple) AVTS Malin & James Roads Brocmall, PA 19008			
Eastern Northampton County AVTS Kesslersville Road, R.D. 1 Easton, PA 18042			
Eastern Montgomery AVTS 175 Terwood Road Willow Grove, PA 19090			
Eastern Westmoreland County AVTS 205 Harrison Avenue Latrobe, PA 15650			
Technical Memorial High School "Y"		X	
Erie County AVTS R.D. 3 Oliver Road Erie, PA 16509		X	Received Resource material.
Fayette County AVTS R.D. 2 Box 122-A Uniontown, PA 15401		X	
Forbes Road East AVTS Beatty & Cooper Roads Monroeville, PA 15146			
Franklin County AVTS Route 6 Chambersburg, PA 17201			
Greater Johnstown AVTS 445 Schoolhouse Road Johnstown, PA 15904		X	Received Resource material.

Area Vocational-Technical Schools of Pennsylvania
Contacted that Offered Courses and/or Programs in Tool and Die

Source of Inquiry	Letters	Tele-Phone	Response
Greene County AVTS R.D. 2, Box 15370 Waynesburg, PA 15370			
Harrisburg-Steelton-Highspire AVTS 3001 North Second Street Harrisburg, PA 17110			
Hazelton AVTS 23rd & McKinley Street Hazelton, PA 18201			
Huntington County AVTS Box E Mill Creek, PA 17060		X	
Jefferson County DuBois AVTS Box 100 Reynoldsville, PA 15851		X	
Juniata-Mifflin County AVTS Pitt Street and Belle Vernon Avenue Box 1010 Lewistown, PA 17044			
Lackawanna County AVTS 200 Adams Avenue Scranton, PA 18503			
Lackawanna County-North AVTS Old Plank Road Mayfield, PA 18433			
Lackawanna County-South AVTS 3201 Rockwell Avenue Scranton, Pa 18508			
Lancaster County AVTS 1730 Hans Herr Drive, Box 322 Willow Street, PA 17584			
Lancaster County-Brownstown AVTS Box 262 Brownstown, PA 17508			

Area Vocational-Technical Schools of Pennsylvania
Contacted that Offered Courses and/or Programs in Tool and Die

Source of Inquiry	Letters	Tele-Phone	Response
Lancaster County-Mt. Joy AVTS R.D. 2 Mt. Joy, PA 17552			
Lancaster County-Willow St. AVTS 1730 Hans Herr Dr., Box 322 Willow Street, PA 17584			
Lawrence County AVTS 750 Wood Street New Castle, PA 16101			
Lebanon County AVTS 833 Metro Drive Lebanon, PA 17042			
Lehigh County AVTS 2300 Main Street Schnecksville, PA 18078			
Lenape AVTS 2215 Chaplin Avenue Ford City, PA 16226		X	
McKeesport AVTS 402 Shaw Avenue Building McKeesport, PA 15130			
Mercer County AVTS P.O. Box 152 Greenville Avenue Ext. Mercer, PA 16137			
Middle Bucks County AVTS Old York Road P.O. Box 317 Jamison, PA 18929			
Monroe County AVTS P.O. Box 66 Bartonsville, PA 18321		X	
Mon Valley AVTS Guttman Boulevard Charleroi, PA 15022			

Area Vocational-Technical Schools of Pennsylvania
Contacted that Offered Courses and/or Programs in Tool and Die

Source of Inquiry	Letters	Tele-Phone	Response
Montgomery County AVTS Colony Office Building 6198 Butler Pike Blue Bell, PA 19422			
Eastern Montgomery AVTS 175 Terwood Road Willow Grove, PA 19090			
North Montco AVTS Sumneytown Pike Lansdale, PA 19446			
Western Montgomery AVTS 77 Gratersford Road Limerick, PA 19468			
Northern Chester County AVTS Charlestown Road Phoenixville, PA 19460			
Northern Westmoreland County Steven Boulevard New Kensington, PA 15068			
North Fayette County AVTS Connellsville Area Jr. High East Locust Lane Extension Connellsville, PA 15425			
Northumberland County AVTS 1700-2000 W. Montgomery St. Shamokin, PA 17872			
Parkway West AVTS R.D. 1, Box 424 Old Steubenville Pike Oakdale, PA 15071			
Philadelphia AVTS School District of Philadel- phia Division of Vocational Educ. John F. Kennedy Center 734 Schuylkill Avenue Philadelphia, PA 19146			

Area Vocational-Technical Schools of Pennsylvania
Contacted that Offered Courses and/or Programs in Tool and Die

Source of Inquiry	Letters	Tele-Phone	Response
Bck AVTS Eighth and Mifflin Streets Philadelphia, PA 19148			
Dobbins AVTS 22nd Street and Lehigh Avenue Philadelphia, PA 19132			
Mastbaum AVTS Frankford Ave. & Clementine Street Philadelphia, PA 19128			
Saul AVTS 7100 Henry Avenue Philadelphia, PA 19128			
Pittsburgh AVTS Pittsburgh School District 635 Ridge Avenue Pittsburgh, PA 15212			
Reading-Muhlenberg AVTS Box 3068 Reading, PA 19064		X	
Schuylkill County AVTS 420 North Centre Street Pottsville, PA 17901			
Schuylkill County-North AVTS Franckville, PA 17931			
Schuylkill County-South AVTS Mar Lin, PA 17951			
Somerset County AVTS R.D. 5, Vo-Tech Road Sommerset, PA 15501			
Steel Valley AVTS 4920 Buttermilk Hollow Road West Mifflen, PA 15122		X	
SUN AVTS 815 East Market Street New Berlin, PA 17855			

Area Vocational-Technical Schools of Pennsylvania
Contacted that Offered Courses and/or Programs in Tool and Die

	Letters	Tele-Phone	Response
Tioga County AVTS R.D. 2, P.O. Box 290-A Wellsboro, PA			
Upper Bucks County AVTS RR 2, Box 207 Perkasie, PA 18944			
Venango County AVTS 1 Voc-Tech Drive Oil City, PA 16301			
Warren County AVTS 345 East Fifth Avenue Warren, PA 16365			
Western Area AVTS R.D. 1, Box 178-A Canonsburg, PA 15317			
West Side AVTS Evans Street Pringle Kingston, PA 18704		X	Received Resource material.
Wilkes-Barre AVTS Jumper Road R.D. 2 Plains Township Wilkes-Barre, PA 18702		X	
*Williamsport AVTS 1005 West Third Street Willimasport, PA 17701			
York County AVTS 2179 South Queen Street York, PA 17402			
Western Montgomery 77 Graterford Rd. Lemerick, PA 18704			

*Williamsport Area Community College providing Area Vocational-Technical School services.

APPENDIX G

Pennsylvania Communtity Colleges Contacted the Offer a Program in Tool and Die Making.

Pennsylvania Community Colleges Contacted
That Offered Courses and/or Programs in Tool and Die

Source of Inquiry	Letters	Tele-Phone	Response
Bucks County Community College Swamp Road Newton, PA 18940 215-968-5861		X	No information.
Butler County Community College College Drive, Oak Hill Butler, PA 16001 412-287-8711		X	Yes courses offered.
Community College of Allegheny County Allegheny Campus 808 Ridge Avenue Pittsburgh, PA 15212 412-237-2525		X	No information.
Community College of Allegheny County Boyce Campus 595 Beatty Road Monroeville, PA 15146 412-327-1327		X	No information.
Community College of Allegheny County South Campus 250 Lebonon School Road West Mifflin, PA 15122 412-469-1100		X	No information.
Community College of Beaver Co. Center Grange Raod Monaca, PA 15061 412-77-8561		X	No information.
Community College of Delaware County Baltimore Pike & Thorton Road Media, PA 19063 215-353-5400		X	No information.

Pennsylvania Community Colleges Contacted
That Offered Courses and/or Programs in Tool and Die

(Continued)

Source of Inquiry	Letters	Tele-Phone	Response
Community College of Philadelphia 34 South 11th Street Philadelphia, PA 19107 215-972-7000		X	No information.
Harrisburg Area Community College 3300 Cameron Street Road Harrisburg, PA 17110 717-236-9533		X	No information.
Lehigh County Community College 2370 Main Street Schnecksville, PA 18078 215-799-2121		X	No information.
Luzerne County Community College 19-21 North River Street Wilkes-Barre, PA 18702 717-735-8300		X	No information.
Montgomery County Community College 612 Fayette Street Corshohocken, PA 19428 215-643-6000		X	No information.
Northampton County Area Community College 3835 Green Pond Road Bethlehem, PA 18017 215-865-5351		X	No information.
Reading Area Community College Fremont and Bruckman Avenues Reading, PA 19605 215-372-4721		X	No information.
Westmoreland County Community College 59 Lincoln Highway East Jennetee, PA 15644 412-836-1600		X	NO information.

Pennsylvania Community Colleges Contacted
That Offered Courses and/or Programs in Tool and Die
(continued)

Source of Inquiry	Letters	Tele-Phone	Response
Community College of Allegheny County 11 Pines Plaza 1103 Perry Highway Pittsburgh, PA 15237 412-366-7000		X	No information.
Williamsport Area Community College 1005 West Third Street Williamsport, PA 17701 717-326-3761		X	Yes-tool designer Resource material was provided.

APPENDIX H

State Directors of Vocational Education

Contacted by letter of Inquiry.

State Directors of Vocational Education Contacted by Letter of Inquiry.

State	Response
Alabama	
Alaska	No information available.
Arizona	
Arkansas	
California	No information available. Referred to colleges with 2 year and apprenticeship programs.
Colorado	No information available. Referred to-Bob Patton, Coordinator, Curriculum and Instructional Materials Center, Stillwater, Oklahoma.
Connecticut	
Delaware	
Washington, DC.	
Florida	No information available.
Georgia	
Guam	
Hawaii	
Idaho	No resource material available.
Illinois	No material available. Referred to celleges with tool and die programs.
Indiana	
Iowa	
Kansas	

State Directors of Vocational Education Contacted by Letter of Inquiry. (Continued)

State	Response
Kentucky	No material available. Referred to: Dr. Bill West, VTECS Coordinator, Indianapolis, Indiana.
Louisiana	
Maine	
Maryland	No resource material available.
Massachusetts	
Michigan	
Minnesota	
Mississippi	
Montana	
Nebraska	No resourse material available.
Nevada	
New Hampshire	
New Jersey	
New Mexico	Sent resource material in the area of Machine Tools.
New York	Resource material received.
North Carolina	Sent resource material for Machine Shop Program.
North Dakota	
Ohio	
Oklahoma	

State Directors of Vocational Education Contacted by Letter of Inquiry. (Continued)

State	Response
Oregon	
Pennsylvania	
Puerto Rico	
Rhode Island	
South Carolina	No information received. Referred to: Dr. Albert Newton, Dept. of Industrial Ed. Clemson Univ.
South Dakota	
Tennessee	
Texas	
Utah	
Vermont	
Virginia	No information available.
Washington	
West Virginia	
Wisconsin	Resource material received.
Wyoming	
American Samoa	
Trust Territory of the Pacific Islands Saipan, Mariana Islands	
Virgin Islands	

APPENDIX I

Responses to Letter of Inquiry Sent to

Organized Training Programs.

Responses to Letter of Inquiry Sent to
Organized Training Programs

Respondent	Response
IUE Apprenticeship Programs Monroeville, Pennsylvania	Resource materials received.
Chief of Naval Education and Training Pensacola, Florida	No information received. Referred to: Pratt and Witney, West Hartford, Connecticut.
Dept. of the Air Force Lackland Air Force Base, Texas	Resource material received.
U.S. Department of Labor Harrisburg, Pennsylvania	Resource material received.
United Glass and Ceramic Workers of North America, AFL-CIO-CLC Ohio	No information available.
Department of the Navy Millington, Tennessee	No information available. Referred to: The Rate Training Manuals for Machinery Repairman.
Department of the Army Alexandria, Virginia	Resource materials received.

APPENDIX J

Letter of request to State Directors of Vocational Education, U.S. Military, Institutions and Agencies.

THE PENNSYLVANIA STATE UNIVERSITY
COLLEGE OF EDUCATION
Division of Occupational and Vocational Studies
RACKLEY BUILDING
UNIVERSITY PARK, PENNSYLVANIA 16802

Dear Sir:

In cooperation with the Bureau of Vocational Education, Pennsylvania Department of Education, we are engaged in the development of a task analysis and criterion referenced catalogue for use in teaching Tool and Die Mechanics..

In order to develop this catalogue of performance objectives and criterion referenced measure, we will conduct an occupational survey based on index measures of tasks performed by incumbent workers and tools and equipment used. It is therefore necessary to assemble listings of tasks performed as well as tools and equipment used.

If you are aware of materials within your state for Tool and Die Mechanic which would be helpful in developing the task listing for the occupational survey, we would greatly appreciate your sharing it with us. We would be most grateful for a prompt response, either including the related information or referring to sources of such information or materials from your state.

If you have any questions, please feel free to call. Thank you for your cooperation.

Sincerely,

Frank W. Adelman

Frank W. Adelman, Ed.D.
Project Director

FWA/mds

Home Economics Education — 814-865-5441 Industrial Arts Education — 814-863-0275 Vocational Industrial Education — 814-865-8361

THE PENNSYLVANIA STATE UNIVERSITY
COLLEGE OF EDUCATION
Division of Occupational and Vocational Studies
RACKLEY BUILDING
UNIVERSITY PARK, PENNSYLVANIA 16802

Dear Sir:

In cooperation with the Bureau of Vocational Education, Pennsylvania Department of Education, we are engaged in the development of a task analysis and criterion referenced catalogue for use in teaching Tool and Die Mechanics.

In order to develop this catalogue of performance objectives and criterion referenced measure, we will conduct an occupational survey based on index measures of tasks performed by incumbent workers and tools and equipment used. It is therefore necessary to assemble listings of tasks performed as well as tools and equipment used.

If you could help us to procure materials for tool and die mechanics which would be helpful in developing the task listing for the occupational analyses survey, we would greatly appreciate your assistance. Such materials might be course outlines, courses of study, equipment lists or tool lists which are used in the training of tool and die mechanics.

We would be grateful for a prompt response, either including the information sought or designating sources of such information or material.

If you have questions, please feel free to call. Thank you for your cooperation.

Sincerely,

Frank W. Adelman

Frank W. Adelman, Ed.D.
Project Director

FWA/lef

Home Economics Education — 814-865-5441 Industrial Arts Education — 814-863-0275 Vocational Industrial Education — 814-865-8361

APPENDIX K

Selected Responses to Letters of Inquiry from Institutions, Agencies, U.S. Military, and State Directors of Vocational Education.

IUE Apprenticeship Programs

DISTRICT ONE FIELD COORDINATOR
1620 Golden Mile Highway • Phone (412) 325-4155
Monroeville, Pennsylvania 15146

June 21, 1978

Mr. Frank W. Adelman, Ed.D.
Project Director
The Pennsylvania State University
College of Education
University Park, Pennsylvania 16802

Dear Mr. Adelman:

Enclosed is a copy of the National Apprenticeship and Training Standards for the IUE.

Also, a copy of the list of apprenticeable occupations and trades, taken from the National Apprenticeship Program.

I trust this is the listing of tasks which you requested. Should you have further questions, please feel free to contact me.

Sincerely,

William R. Moorhead

William R. Moorhead
Field Coordinator

WRM/dw

cc: E.L. Ransom
P.W. Carmichael

enclosures

DEPARTMENT OF THE AIR FORCE
COMMUNITY COLLEGE OF THE AIR FORCE (ATC)
LACKLAND AIR FORCE BASE, TEXAS 78236

31 MAY 1978

Dr Frank W. Adelman
Pennsylvania State University
Division of Occupational and
Vocational Studies
Rackley Building
University Park, Pennsylvania 16802

Dear Dr Adelman

In response to your letter dated 23 May 1978, I have enclosed a Job Inventory for the Machinist Career Ladder since the Air Force does not have a specific course for Tool and Die Mechanics. This booklet may provide some worthwhile information for your project.

As you may already be aware, your state is a member of the Vocational-Technical Education Consortium of States (V-TECS). This consortium is a cooperative venture of member states for the purpose of developing catalogs of performance objectives and criterion-referenced measure in occupational education through the sharing of resources and technology. You may also be interested in their catalog on Machine Shop. Dr Frank Rozman, V-TECS coordinator for your state, should be able to provide this catalog to you.

If I can be of any further service, please do not hesitate to call on me.

Sincerely

Wade R. Kilbride

WADE R. KILBRIDE, Lt Col, USAF
Chief, Professional Relations
Division

1 Atch
Job Inventory (sep cover)

CHIEF OF NAVAL EDUCATION AND TRAINING
NAVAL AIR STATION
PENSACOLA, FLORIDA 32508

Code N-511
21 JUN 1978

Dr. Frank W. Adelman, Project Director
Division of Occupational and Vocational Studies
Rackley Building
The Pennsylvania State University
University Park, Pennsylvania 16802

Dear Dr. Adelman:

Thank you for your May 23 inquiry expressing a need to procure materials for tool and die mechanics which would be helpful in developing a task listing for an occupational analysis survey.

As you may have expected, the Navy engages in no tool and die making. Accordingly, no Navy training is provided in this area. My staff here at Naval Education and Training Command Headquarters has queried the Navy CANTRAC (Catalogue of Navy Training Courses) and has found no tool and die making coverage among Navy formal courses. Further search into Rate Training Manuals (for advancement purposes) and correspondence courses also revealed no coverage.

In the process of inquiry, however, it was recommended that you contact Pratt and Whitney, a division of United Aircraft Corporation, at West Hartford, Connecticut. Pratt and Whitney, I am told, conducts a very outstanding apprentice training program for tool and die mechanics.

I regret that we here at Headquarters were unable to designate for you a source within the Navy, but I am confident that Pratt and Whitney will be of some assistance to you.

Sincerely,

Worth Scanland

WORTH SCANLAND
Assistant Chief of Staff for
Research and Program Development

STATE OF IDAHO
STATE BOARD FOR VOCATIONAL EDUCATION
650 WEST STATE STREET
LEN B. JORDAN BUILDING
BOISE, IDAHO 83720

June 16, 1978

Mr. Frank W. Adelman, Ed.D.
Project Director
The Pennsylvania State University
Division of Occupational and Vocational Studies
Rackley Building
University Park, Pennsylvania 16802

Dear Mr. Adelman:

Your letter of June 1, 1978, regarding tool and die mechanic task analysis catalog has been circulated to appropriate staff members for response. Regretfully, die making courses are not offered in Idaho and therefore we have not compiled appropriate information.

A question remains as to the true job description of a tool and die mechanic in comparison to a tool and die maker. There are limited job opportunities for die makers in Idaho which partially justifies our limited resources we have on hand in that occupational area.

Assuredly, some of the western coastal states will be able to assist you as the die making industry is predomently located in that region.

Best of luck in your analysis search and we regret being unable to assist you further.

Sincerely,

Larry Selland

Larry G. Selland, Ph.D.
State Administrator

LGS:RAP:ss

STATE OF NEW MEXICO
DEPARTMENT OF EDUCATION — EDUCATION BUILDING
SANTA FE - 87503

LEONARD J. DE LAYO
SUPERINTENDENT OF PUBLIC INSTRUCTION

June 23, 1978

Dr. Frank W. Adelman
Pennsylvania State University
College of Education
Division of Occupational and Vocational Studies
Rackley Building
University Park, Pennsylvania 16802

Dear Dr. Adelman:

Your letter to Ms. Wilma Ludwig, State Director of Vocational Education, has been forwarded to me for response.

Unfortunately, we do not have any materials developed in the area of machine tool. As there are only two machine tool programs in the state very little emphasis or time has been spent developing materials.

I am enclosing a brochure on the "Mid-America Vocational Curriculum Consortium" that may have material developed in the area of machine tool.

I am very sorry that I could not be of any assistance to you. I would appreciate being kept informed of your progress in the development of the project.

I wish you every success in your endeavors.

Sincerely,

Willis G. McLaughlin

Willis G. McLaughlin
Assistant State Supervisor
Trade & Industrial Education

WGM:cmc

Enclosure

WILSON RILES
Superintendent of Public Instruction
and Director of Education

STATE OF CALIFORNIA
DEPARTMENT OF EDUCATION
STATE EDUCATION BUILDING, 721 CAPITOL MALL, SACRAMENTO 95814

June 12, 1978

Dr. Frank Adelman
Project Director
Pennsylvania State University
Rackley Building
University Park, Pennsylvania 16802

Dear Dr. Adelman:

Mr. Samuel Barrett, State Director of Vocational Education, appreciated receiving your inquiry on instructional materials for the Tool and Die mechanic and requested that we respond to you. We have no state curriculum materials for this area, but have listed below the community colleges which do currently offer this type of instruction. Please feel free to contact them directly for assistance.

Regular 2 Year Program

Chabot College
25555 Hesperian Blvd.
Hayward, Calif. 94545

Los Angeles Harbor College
1111 Figueroa Place
Wilmington, Calif. 97044

Santa Monica City College
1900 Pico Blvd.
Santa Monica, Calif. 90405

Apprenticeship Programs (144 hrs. per year)

Laney College
900 Fallon Street
Oakland, Calif. 94607

San Jose City College
2100 Moorpark Ave.
San Jose, Calif. 95128

Santa Ana College
17th Street at Bristol
Santa Ana, Calif. 92706

Yours very truly,

James T. Allison

James T. Allison, Acting Chief
Bureau of Industrial Education
(916) 445-2461

JTA/sje

DEPARTMENT OF PUBLIC INSTRUCTION

STATE OF NORTH CAROLINA RALEIGH

June 19, 1978

Dr. Frank W. Adelman
Project Director
Division of Occupational and
Vocational Studies
Pennsylvania State University
University Park, Pennsylvania 16802

Dear Dr. Adelman:

Enclosed is a copy of the competency listing for Machine Shop programs in North Carolina. This is the only information we have available at the present time. Hopefully, it will be of help to you in the development of a task analysis and criterion referenced catalogue for Tool and Die Mechanics.

Upon completion of this project, we would be most appreciative of receiving a copy of the finished product.

Sincerely,

Ted R. Rollins
Chief Consultant
Trade and Industrial Education

TRR:th

Enclosure

U.S. DEPARTMENT OF LABOR
BUREAU OF APPRENTICESHIP AND TRAINING
P. O. Box 1042
Harrisburg, Pa. 17108

June 12, 1978

Dr. Frank W. Adelman
110 Rackley Building
Penn State University
University Park, Pa. 16802

Dear Dr. Adelman:

In accordance with our recent telephone conversation we are enclosing several sample copies of Tool and Die Maker work processes, together with the physical demands of the trade.

Enclosed also is a copy of The National Apprenticeship Program booklet which may be of interest to you.

If you should be in need of any additional information at a later time, I would suggest you contact Joseph Hersh, the Apprenticeship and Training Representative covering your particular area. Mr. Hersh is located at 615 Howard Avenue, Altoona, Pa. 16601; Telephone Number 814 - 944-4641, Ext. 41.

Sincerely yours,

Francis E. Mulligan

Francis E. Mulligan
Field Representative

Enclosures

Bethlehem Area Vocational-Technical School
3300 Chester Avenue
Bethlehem, Pa. 18017

June 12, 1978

Ms. Lurline V. Walker
Associate Director
Dept. of Voc. Ed.
110-B Rackley Building
Penn State University
University Park, PA 16801

Dear Ms. Walker:

I am enclosing my course outline for Tool & Die Design Technology as per our conversation. I hope that you find this of some value. I am looking forward to receiving completed materials in return as per our agreement.

If I can be of any further assistance, please do not hesitate to contact me.

Sincerely,

Roland H. Holvey

DEPARTMENT OF THE NAVY
CHIEF OF NAVAL TECHNICAL TRAINING
NAVAL AIR STATION MEMPHIS (75)
MILLINGTON, TENNESSEE 38054

Code N13
5600
31 May 78

The Pennsylvania State University
Division of Occupational and Vocational Studies
Mr. Frank W. Adelman, Ed. D.
Project Director
Rackley Building
University Park, Pennsylvania 16802

Dear Mr. Adelman:

The Navy does not have a specific training program for Tool and Die Mechanics. Basic tool and die instruction is given in Machinery Repairman Rate Training Manuals.

The Rate Training Manuals for Machinery Repairman are:

NAVPERS 10530-D Machinery Repairman 3 & 2

NAVPERS 10531-C Machinery Repairman 1 & C

The above listed books may be obtained by writing to Commanding Officer, (Code ETM2), Naval Education and Training Program Development Center Ellyson, Pensacola, FL 32509.

It has been a pleasure to have been of service to you.

Sincerely,

P. CARDINAL
Publications and Printing Branch
By direction

Copy to:
NAVEDTRAPRODEVCEN ELLYSON (Code ETM2)

STATE BOARD OF EDUCATION
ILLINOIS OFFICE OF EDUCATION

Joseph M. Cronin
State Superintendent of Education

June 6, 1978

Frank W. Adelman, Ed.D.
Pennsylvania State University
College of Education
Rackley Building
University Park, Pennsylvania 16802

Dear Dr. Adelman:

I'm sorry to inform you that I am not aware of any materials that would be helpful for your project. I am, however, submitting a list of Community Colleges which are currently offering Tool and Die programs. Perhaps they will be able to assist you.

According to my information the following Colleges have approved Tool and Die programs:

Black Hawk College
6600 34th Avenue
Moline, Illinois 61264

Highland Community College
RFD No. 2 - Pearl City Road
Freeport, Illinois 61032

Elgin Community College
1700 Sparton Drive
Elgin, Illinois 60120

Kishwaukee College
Rt. 38 and Malta Road
Malta, Illinois 60150

Prairie State College
197th and Halsted Streets
P.O. Box 487
Chicago Heights, Illinois 60411

Rock Valley College
3301 N. Mulford Road
Rockford, Illinois 61111

Triton College
2000 Fifth Avenue
River Grove, Illinois 60171

The Dean of Career Education or Vocational Education at each of the above institutions would be the logical place to start.

I hope this information is beneficial to you. Please feel free to contact me if I can be of further assistance.

Sincerely,

Ronald A. Miller, Consultant
Industrial Occupations
Adult, Vocational and Technical Education

RAM:kdl

100 North First Street
Springfield, Illinois 62777
217/782-4321

188 West Randolph
Chicago, Illinois 60601
312/793-2220

State Office Building
601 North 18th
Mt. Vernon, Illinois 62864
618/242-1676

Post Office Box 825
DeKalb, Illinois 60115
815/753-0261

3 Henson Place
Champaign, Illinois 61820
217/333-8770

DEPARTMENT OF THE ARMY
U.S. ARMY MILITARY PERSONNEL CENTER
200 STOVALL STREET
ALEXANDRIA, VIRGINIA 22332

REPLY TO
ATTENTION OF:

DAPC-MSP-S

2 JUN 1978

Mr. Frank W. Adelman, Ed.D.
The Pennsylvania State University
College of Education
Division of Occupational and Vocational Studies
Rackley Building
University Park, PA 16802

Dear Mr. Adelman:

Reference is made to your letter of May 23, 1978 requesting material for use in teaching Tool and Die Mechanics.

Enclosed please find two task lists concerning civilian compatible military occupations closest to your requirements.

We request that use of or reference to this material cite the U.S. Army Occupational Survey Branch, US Army Military Personnel Center as the source.

If you find the items useful, a brief statement describing their value to your program would be most appreciated.

Sincerely,

B. Michael Berger

B. MICHAEL BERGER
Chief, Occupational
Survey Branch

2 Enclosures

COMMONWEALTH of VIRGINIA

DEPARTMENT OF EDUCATION
RICHMOND, 23216

June 7, 1978

Dr. Frank W. Adelman
Project Director
Pennsylvania State University
Rackley Building
University Park, Pennsylvania 16802

Dear Dr. Adelman:

Dr. Garner forwarded your letter of June 1 requesting materials available for the subject area of Tool and Die Mechanic.

I am sorry to report that, at this time, we have no listing of task or equipment to be used in this program. In Virginia, we do offer a Machine Shop program but nothing as specific as Tool and Die Mechanic.

Sincerely yours,

Ben L. Baines

Ben L. Baines, Supervisor
Trade and Industrial Education

BLB/srw

BUTLER
COUNTY
COMMUNITY
COLLEGE

College Drive, Oak Hills, Butler, Pennsylvania 16001 Phone 287-8711

May 31, 1978

Ms. Lurline Walker, Associate Director
Division of Vocational Education
104 Rackley Building
Pennsylvania State University
University Park, PA 16802

Dear Ms. Walker:

In reply to your phone call this morning, I am enclosing our course syllabus for "Tool and Die Design." Also enclosed is a copy of the Williamsport Area Community College brochure on their Associate Degree program of "Tool Design."

I trust this will assist you in answering your questions.

Sincerely,

Lawrence C. Miller, Ph.D.
Professor, Engineering Technology

LCM/pk